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Leaflets on Philippine botany.—Under this title A. D. E. ELMER proposes to issue in serial form articles on Philippine plants, both scientific and economic, printed in English, Latin, German, or French. This publication will appear at irregular intervals, at a subscription price of 1¾ cents per page, and may be obtained by addressing the editor at Manila. The first issue is a paper of 41 pages entitled *Philippine Rubiaceae*, by the editor, containing 150 species, of which 45 are new, representing 42 genera.—J. M. C.

Das Pflanzenreich.[3]—Part 26 contains the Droseraceae by L. DIELS. Drosophyllum, Dionaea, and Aldrovanda are regarded as monotypic genera; while Drosera is credited with 84 species, 5 of which are new. A very full discussion of structure and range precedes the synopsis.—J. M. C.

Pflanzenfamilien.[4]—Part 224 includes the completion of the Spiridentaceae, the Lepyrodontaceae, and the Pleurophascaceae, and a portion of the Neckeraceae, all by V. F. BROTHERUS. Part 225 continues the Ascolichenes by A. ZAHLBRUCKNER.—J. M. C.

NOTES FOR STUDENTS.

Revelations of the ultramicroscope.—GAIDUKOV has been seeing previously invisible things by means of SEIDENTOPF'S ultramicroscope, and hastens to communicate them in two preliminary papers.[5] After mastering the rather difficult technique and the sources of error, he began by observing the expressed contents of a Vaucheria filament, but later found that it was possible to observe the contents *in situ*. He saw the ultramicroscopic particles of plasma and chlorophyll, the former white and blue, the latter red and green—colors whose significance is unknown as yet for lack of sufficient physical investigation of the instrument. He watched the collision of plasma particles with structureless oil drops and their recoil, and the like collisions of chlorophyll particles and their disappearance in the oil, in which the number of red and green chlorophyll granules steadily increased. This appears to be actually the formation of a colloidal solution of chlorophyll in oil—an oleosol.

In examining a living filament he found that the protoplasm occupied a much greater space than appears with ordinary illumination, only a very small part of the filament being optically empty. In the chloroplasts of Mesocarpus, roundish or stellate flecks of chlorophyll particles are distributed through the stroma, whose structure is like that of the protoplasm; there is no indication of the solution of chlorophyll in oil droplets lying in the stroma—a widely accepted notion.

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[3] ENGLER, A., Das Pflanzenreich. 26 Heft. Droseraceae von L. DIELS. pp. 136. *figs. 40 (286), map 1.* Leipzig: Wilhelm Engelmann. 1906. *M* 6.80.

[4] ENGLER, A. und PRANTL, K., Die natürlichen Pflanzenfamilien. Lieferungen 224 and 225. Leipzig: Wilhelm Engelmann. 1906.

[5] GAIDUKOV, N., Untersuchungen mit Hilfe des Ultramikroskopes nach Seidentopf. Ber. Deutsch. Bot. Gesells. **24**:107–112, 155–157. 1906.

The nucleus of Tradescantia appears to have a structure like protoplasm, but much more compact.

Bending movements of Oscillaria are accompanied by wave-like movements of particles in the cells; and the longitudinal movements by a streaming of particles on the surface in a direction opposite to that of the motion of the filament. These particles pass off into the water when they reach the end of the filament.

Ultramicroscopic organisms in figure-of-8 forms, and colonies in form like certain flagellates, similar to the organisms already described by RAEHLMANN, were found in every preparation.

Protoplasmic movements have been seen in all organisms investigated, and the ordinary rotation and streaming is by no means the simple flow it seems to be, but is probably initiated by a complex motion of the ultramicroscopic particles (ultramicrons) of the protoplasm, whose structure seems identical with that of colloidal solutions as determined by ZSIGMONDY with the instrument. The first movement, indeed, may be what has long been known as the Brownian movement, once so carefully distinguished from the "vital" ones as "purely physical."

In plasmolysis GAIDUKOV has seen the protoplasmic particles move from the periphery toward the center of the cell, changing shape at the same time from round to vermicular, while in the chloroplast simultaneously the vermicular chlorophyll particles creep out upon the surface. In Flagellatae there is a vigorous movement of particles in the region of the cilia and below the mouth opening, before the gross movements begin.

Whereas in chlorophyllose cells the cell wall is optically empty (*leer*), enabling one to see the cell contents clearly, the wall of bacteria and fungi has so complex a structure that nothing can be seen through it. Yet the purple bacteria which also work photosynthesis have a wall optically empty. These facts are believed to be related to the necessity for transparence to light in photosynthetic cells.—C. R. B.

Araucarieae.—A. C. SEWARD and SIBILLE O. FORD have published the results of a study of the Araucarieae.[6] The two living genera representing the group, Agathis and Araucaria, have long stood somewhat stiffly apart from other Coniferales, not only on account of the known facts in reference to them, but chiefly, perhaps, on account of lack of knowledge. The authors have marshalled our knowledge of extinct and living forms in this memoir; and however opinions may differ as to their conclusions, there can be only one opinion as to the value of the work. The subject is presented under the following captions: distribution, generic diagnosis, seedlings, stem anatomy, roots, leaves, leaf-traces, reproductive shoots, fossil Araucarieae, and phylogenetic considerations and conclusion. The details are too numerous to be included in a review, but the conclusions are too important to be passed over lightly.

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[6] SEWARD, A. C. and FORD, SIBILLE, O., The Araucarieae, recent and extinct Phil. Trans. Roy. Soc. London. B. **198** :305–411. *pls. 23–24. figs. 28.* 1906.